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Omphalodes akiensis (*Boraginaceae*), a New Species from Hiroshima Prefecture, Western Japan

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A new species, *Omphalodes akiensis* Kadota (*Boraginaceae*), is described from Hiroshima Pref., western Japan. *Omphalodes akiensis* is similar to *O. prolifera* Ohwi in having decumbent scapes with plantlets at the axil of inflorescence but is distinguished from the latter by thicker, dimly lustrous basal leaves with longer petioles, forked inflorescence, shorter, shallowly lobed calyx-tubes with narrowly ovate-lanceolate lobes obtuse at apex. *Omphalodes akiensis* is distributed in Hiroshima Pref. and the southwestern part of Tottori Pref. and grows rather commonly on rich soils in open valleys. A white-flowered form of *Omphalodes akiensis* is also described.

Key words: *Boraginaceae*, Hiroshima Prefecture, Japan, *Omphalodes akiensis*, *Omphalodes prolifera*, new form, new species, Tottori Prefecture.

The genus *Omphalodes* (*Boraginaceae*) consisting of ca. 20 species is distributed in Eurasia and N. Africa, and four species are recognized in Japan (Murata 1981, Yamazaki 1993). *Omphalodes prolifera* Ohwi (1953) was described based on the collection, K. Inami s.n. (TNS 133753; Fig. 1), from Prov. Owari [Aichi Pref.], Jôkôji-san, central Honshu, Japan and was considered to be different from *O. japonica* (Thunb.) Maxim. by having longer basal leaves sericeous with long, appressed hairs only, a few scapes with plantlets at the basal part of the inflorescence, calyx-lobes slightly acute at apices and slightly longer corolla-tubes (Ohwi 1953, 1965: fig. 14, Inami 1971, Murata 1981, Yamazaki 1993). Later Inami (1985: fig. III-73) reported and illustrated this species in Hiroshima Prefecture, western Honshu, Japan. After his report the plants in question have been known as "*Omphalodes prolifera* in Hiroshima Pref." (e.g., Flora of Hiroshima Prefecture 1997).

In 2006 some specimens of *Omphalodes* from Hiroshima Pref. were sent to me by Dr. Masahiko Kubota, Hiroshima-shi, Hiroshima Pref. After that, Dr. Kubota collected *Omphalodes* plants in Hiroshima, Tottori and Okayama Prefectures and sent them to me several times. As the result of examination it has turned out that the plants from Hiroshima Prefecture and the adjacent regions should not be ascribed to *O. prolifera* and belong to an undescribed species. Here this species will be described as a new species, *Omphalodes akiensis* Kadota.

Omphalodes akiensis Kadota, sp. nov.
[Figs. 2–4]

Omphalodes prolifera auct. non Ohwi: T.

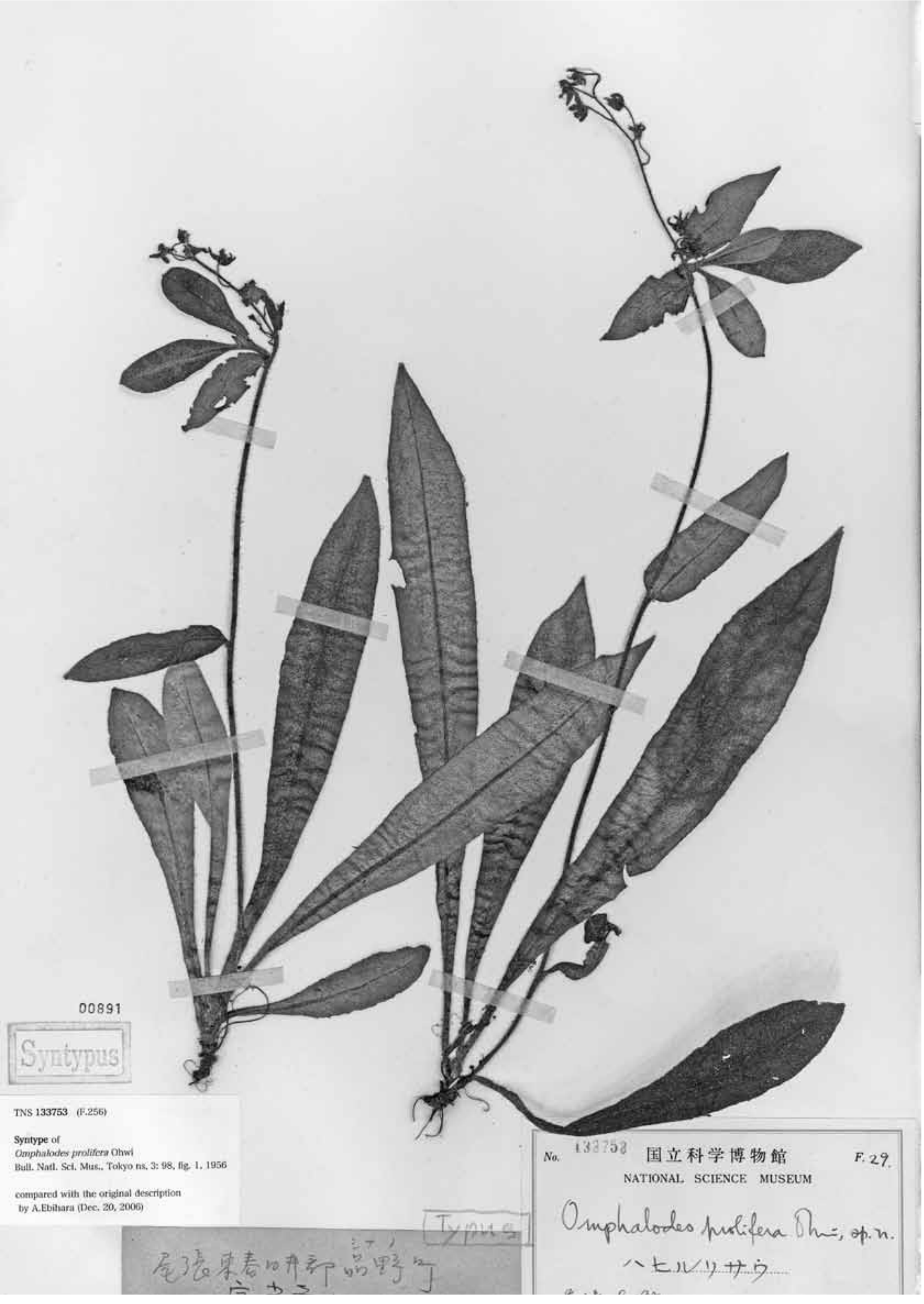
00891
Syntypus
TNS 133753 (F.256)
Syntype of
Omphalodes prolifera Ohwi
Bull. Natl. Sci. Mus., Tokyo ns, 3: 98, fig. 1, 1956
compared with the original description
by A.Ebihara (Dec. 20, 2006)
Typus
尾張東春日井郡品野町
シナノ
No. 133753 国立科学博物館 F. 29.
NATIONAL SCIENCE MUSEUM
Omphalodes prolifera Ohwi, sp. n.
ハヒルリサウ

Fig. 1. Type of *Omphalodes prolifera* Ohwi (JAPAN, Honshu, Mt. Jokojisan, Shinanomachi in Owari prov. [Aichi Pref., Seto-shi], 10–17 June 1955, K. Inami s.n., TNS 133753, holotype).

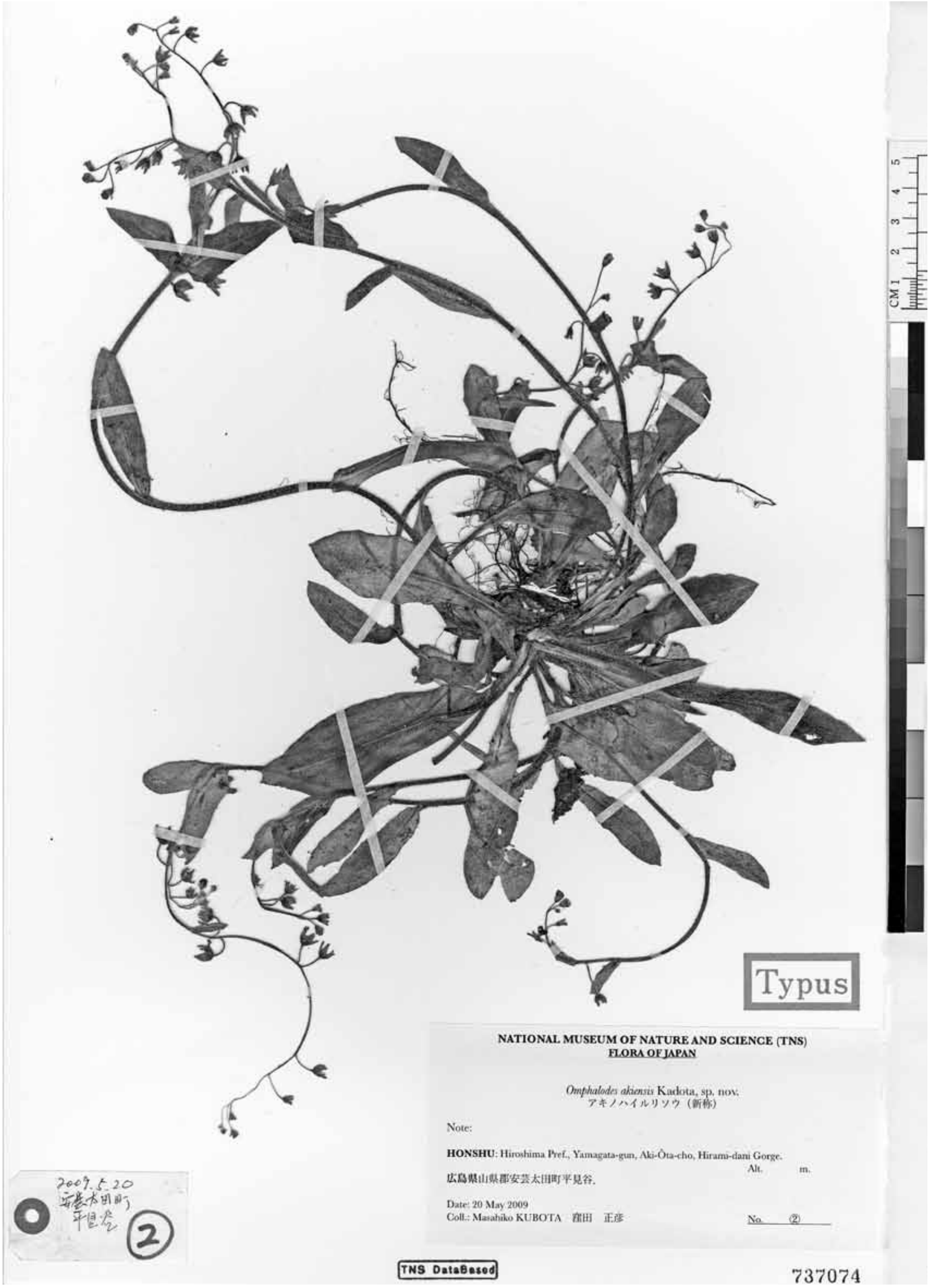
CM 1 2 3 4 5
Typus
NATIONAL MUSEUM OF NATURE AND SCIENCE (TNS)
FLORA OF JAPAN
Omphalodes akiensis Kadota, sp. nov.
アキノハイルリソウ（新称）
Note:
HONSHU: Hiroshima Pref., Yamagata-gun, Aki-Ôta-cho, Hirami-dani Gorge.
Alt. m.
広島県山県郡安芸太田町平見谷.
Date: 20 May 2009
Coll.: Masahiko KUBOTA 窪田 正彦
No. ②
TNS DataBased
737074
2009.5.20
安芸太田町
平見谷
②

Fig. 2. Type of *Omphalodes akiensis* Kadota (JAPAN, Honshu, Hiroshima Pref., Yamagata-gun, Aki-Ôta-cho, Hirami-dani Gorge, 20 May 2009, M. Kubota 2, TNS 737044, holotype).

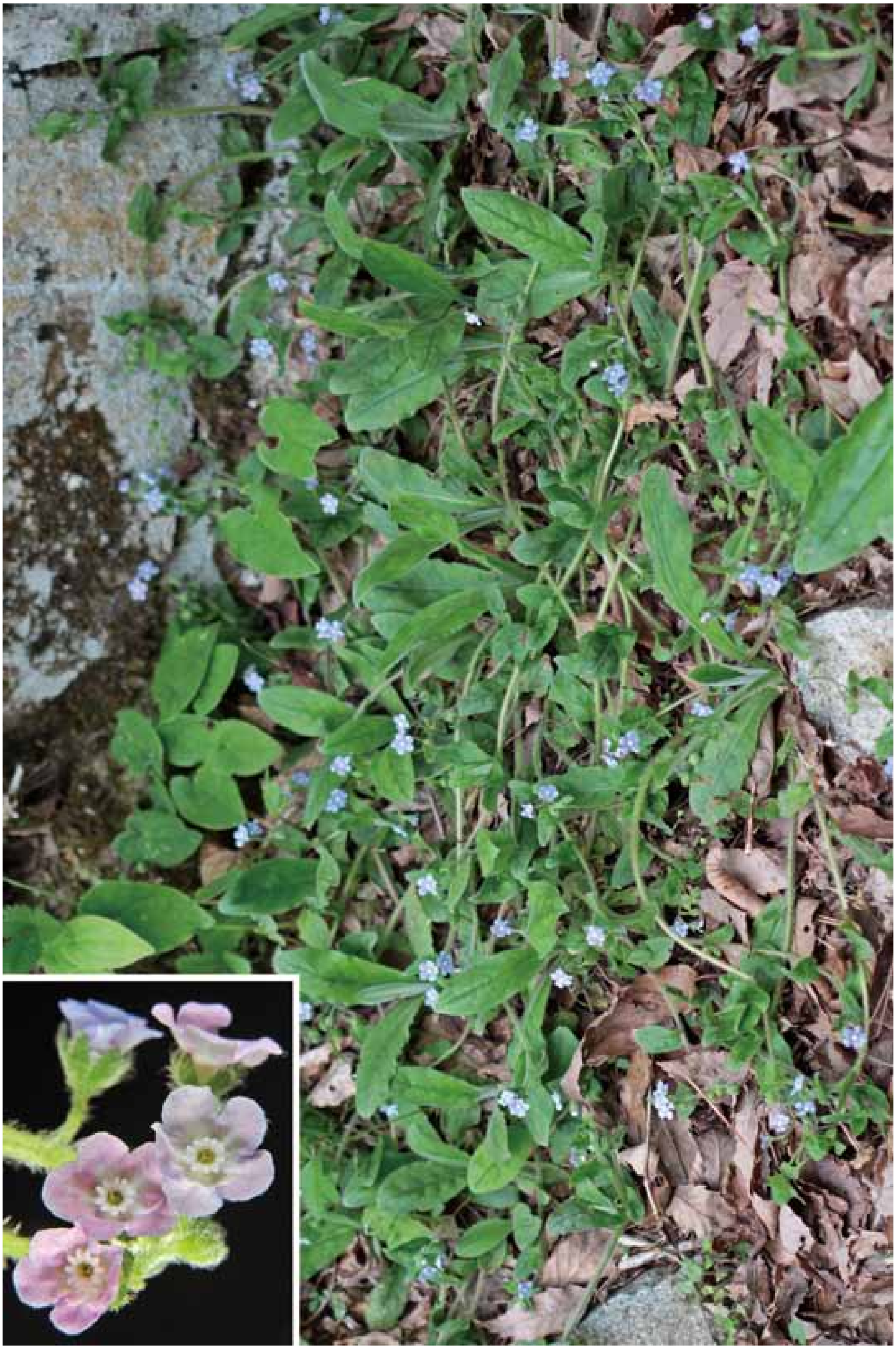

Fig. 3. Habit of *Omphalodes akiensis* Kadota (JAPAN, Honshu, Hiroshima Pref., Yamagata-gun, Aki-Ôta-cho, Hirami-dani Gorge, 25 May 2009, photo by M. Kubota). Left corner inset shows an apical part of inflorescence from Mizoguchi, Aki-Ôta-cho, Hiroshima Pref.

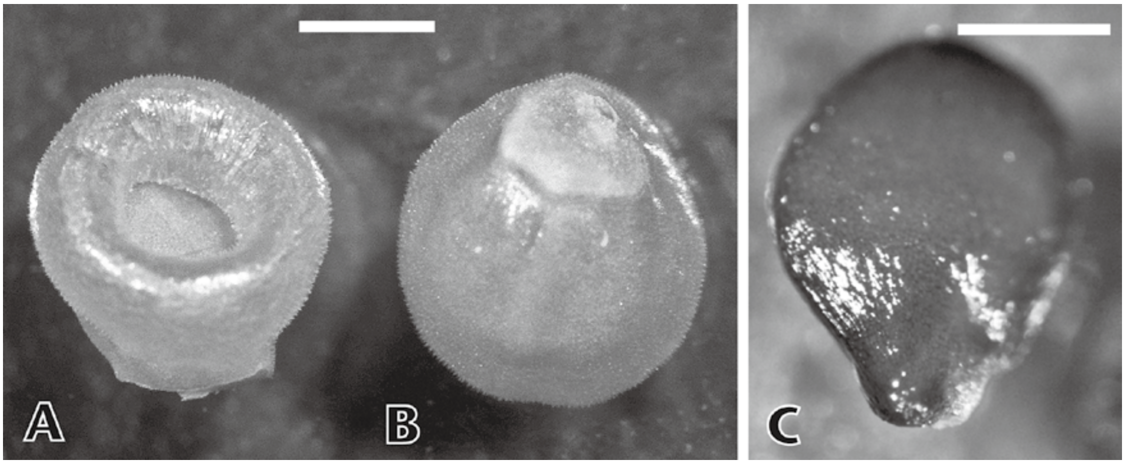

Fig. 4. Nutlet (A–B) and seed (C) of *Omphalodes akiensis* Kadota. A. Adaxial view. B. Abaxial view. All from Hirami-dani Gorge, Aki-Ôta-cho, Hiroshima Pref. Scale = 1 mm.

Yamaz., Fl. Jap. **IIIa**: 251 (1993), quoad pl. ex Hiroshima Pref.

Proxima *Omphalodi proliferae* scapis decumbentibus proliferis, sed foliis basalibus crassioribus aliquantum nitidis longe-petiolatis, inflorescentiis furcatis, tubis calycum brevioribus non profunde lobatis et lobis calycum apice obtutis differt.

TYPE: JAPAN, Hiroshima Pref., Yamagata-gun, Aki-Ôta-cho, Hirami-dani Gorge, 20 May 2009, M. Kubota 2 (TNS 737044–holotype; Fig. 2).

A rosulate, perennial herb. Rhizome short, 1–2 cm long, oblique. Scapes 1–10 or more, up to 50 cm long at fruiting time, densely hirsute with subpatent hairs, decumbent from the beginning of the year’s growth. Basal leaves herbaceous, dimly lustrous, oblanceolate to spathulate, 8–24 cm long (including petioles), 1.5–4 cm wide, acute at apex, densely sericeous with long, appressed hairs on both sides, petiolate; petioles 2–7 cm long, winged, vaginate at base. Cauline leaves sessile, amplexicaul, oblong, 4–7 cm long, 1.2–1.7 cm wide, acute at apex, similarly pubescent to the base. Cymes raceme-like, 4–11-flowered, 4–12 cm long, forked, bracteate; bracts foliaceous, narrowly ovate-oblong, 3–5.5 cm long, 1–2 cm wide, proliferous at the axil of the lowest bract; pedicels ca. 1 cm long, densely hirsute. Corollae cobalt blue, rosy or rarely white, 8–10 mm in diameter; lobes obtuse, 3–4 mm long; tubes ca. 3 mm long; appendages (coronae) 1.5 mm long, white, reverse V-shaped. Stamens inserted at the node of the corollae; anthers yellowish white, 1 mm long, dorsifixed; filaments 0.5 mm long. Calyx-tubes 3.5–4 mm long, 5-lobed to 7/10 from the base, densely hirsute; calyx-lobes narrowly ovate-triangular, obtuse at apex, 2.5–3 mm long in the flowering time, to 5 mm long in the fruiting time. Nutlets 4, ca. 2 mm in diameter; circular protuberance (crown, Johnston 1952, Wang 1984; cupular abaxial projection, Zhu et al. 1995) light brown, ca. 2 mm in diameter, 0.5–0.7 mm wide, covered with minute papillae (Figs. 4A, B). Seeds obovoidal, flattened, dark brown, ca. 3 mm long (Fig. 4C). Chromosome number 2n = 24.

Japanese name: Aki-no-hai-rurisô.

新和名：アキノハイルリソウ

Additional specimens examined: JAPAN: Honshu; **Hiroshima Pref**., Yamagata-gun, Aki-Ôta-cho, Hirami-dani Gorge, 20 May 2009, M. Kubota 2, 4 (TNS 737055–737084). Kita-Hiroshima-cho, Mizoguchi, 24 June 2006, fr., M. Kubota s.n. (TNS 757827–757831); Mizoguchi, 20 May 2009, fl., M. Kubota s.n. (TNS 737066–737073). Miyoshi-shi, Arihara-machi, 18 April 2009, M. Kubota s.n.

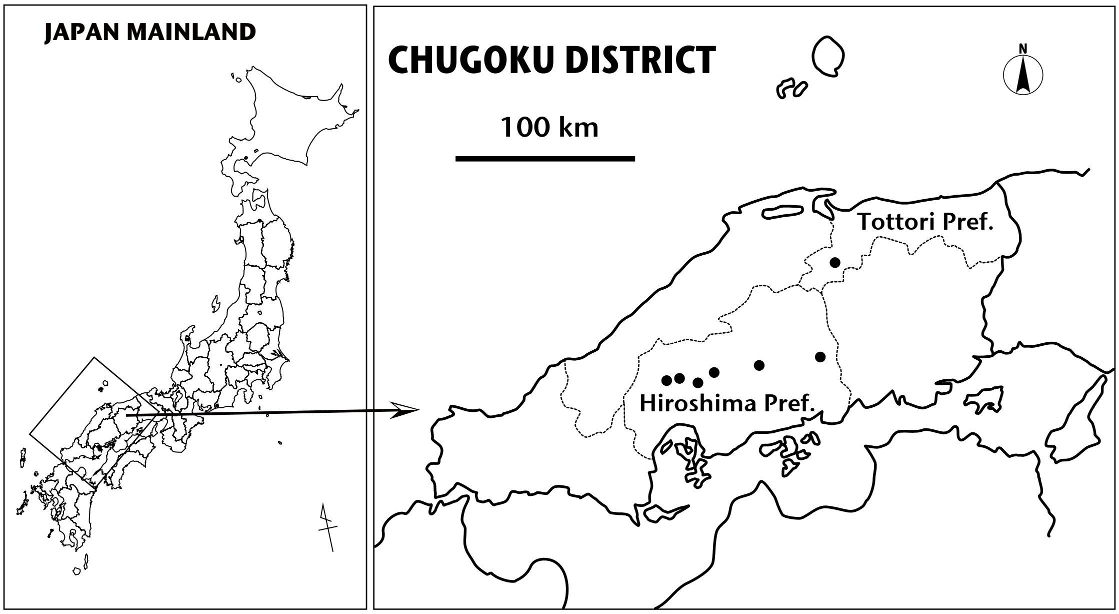

Fig. 5. Distribution of *Omphalodes akiensis* Kadota.

(TNS 736165–736166); Miwaka-machi, 34°43′20.8″N 132°52′42.7″E, 21 May 2009, M. Kubota 3 (TNS 737063–737064); Shimo-Shiwachi-machi, 34°43′50.5″N 132°50′45.1″E, 21 May 2009, M. Kubota 6 (TNS 737085–737088) . Jinseki-gun, Jinseki-Kôgen-cho, Kusagi, 17 May 2007, M. Kubota s.n. (TNS 770916–770918). **Tottori Pref**., Hino-gun, Nichinan-cho, Shôyama, 13 May 1976, J. Haginiwa 1245 (TNS 951245); Nichinan-cho, Sekka-kei to Shôyama Railway Station, 13 May 1876, J. Haginiwa 1244 (TNS 951244); Nichinan-cho, Kasumi, 35°10′12.5″N 133°17′30.0″E, 28 May 2009, M. Kubota s.n. (TNS 737089–737098).

Distribution: Honshu (Hiroshima and Tottori Prefs.; Fig. 5). Endemic to Japan.

Etyimology: The specific epithet "*akiensis*" is derived from the old name of the western part of Hiroshima Pref., western Honshu, Japan.

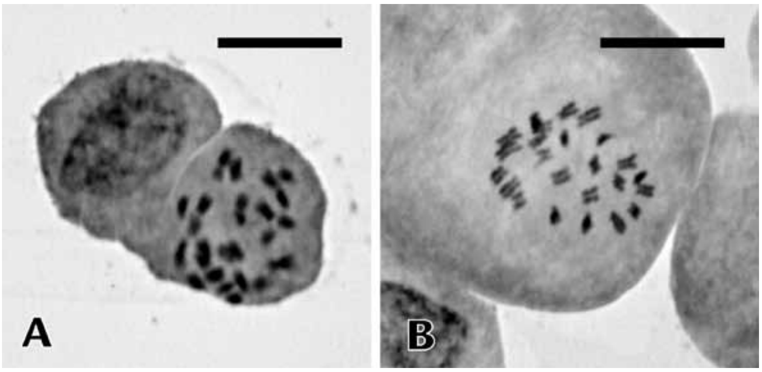

Fig. 6. Somatic chromosomes of *Omphalodes akiensis* Kadota (A) and *O. japonica* (Thunb.) Maxim (B). Voucher specimen. A. JAPAN: Honshu, Hiroshima Pref., Yamagata-gun, Kita-Hiroshima-cho, Mizoguchi, 21 May 2009, M. Kubota s.n., TNS 737072. B. JAPAN: Honshu, Okayama Pref., Takahashi-shi, Narai, 31 May 2009, M. Kubota s.n., TNS 737100. Scale = 10 µm. Courtsey of Dr. T. Nishikawa.

Omphalodes akiensis is distinguished from *O. prolifera* Ohwi by thicker, dimly lustrous basal leaves with longer petioles, procumbent scapes from the time of sprouting in spring, forked inflorescences and shorter, shallowly lobed calyx-tubes with narrolwy ovate-lanceolate lobes obtuse at apices.

The Hirami-dani Gorge, Aki-Ôta-cho, Yamagata-gun, Hiroshima Pref., the type locality of *Omphalodes akiensis*, has been believed to be the site where Mr. K. Inami observed this species (Kubota pers. comm.).

Both *Omphalodes akiensis* and *O. japonica* has the somatic chromosome number of 2n = 24 (Fig. 6). This is the first report within the genus *Omphalodes* in Japan (Nishikawa 2008).

Katsuyama (1997) listed *O. prolifera* in Nagano Prefecture, central Honshu, Japan based on the collection from Mt. Kumabushi-yama, Tenryû-mura, Shimoina-gun, Nagano Pref. (7 July 1957, M. Matsumura 5336, TNS 298319). However, detailed examination of the collection revealed that the specimen TNS 298319 is ascribable to *O. japonica* (Thunb.) Maxim. not to *O. prolifera* Ohwi. Because the specimen TNS 298319 during fruiting time has no plantlets at the basal parts of the inflorescences and the leaves are covered with two kinds of trichomes (short and long hairs). Hence *O. prolifera* is concluded to be restricted to Aichi Pref., central Honshu, Japan.

In May of 2009, I tried to do field examinations in the Jôkôji-san area, Aichi Pref., the type locality of *O. prolifera*. But no *Omphalodes* plants were found in the area. There seems to be a possibility that *O. prolifera* is extinct in the type locality (Aichi-ken Shokubutsu Chôsa-kai 1996).

Omphalodes akiensis Kadota f. **albiflora** Kadota, f. nov.

A typo corollis albidis differt.

TYPE: JAPAN: Hiroshima Pref., Yamagata-gun, Aki-Ôta-cho, Mizoguchi, 20 May 2009, M. Kubota 5 (TNS 737065–holotype).

Japanese name: Shirobana-Aki-no-hai-rurisô.

新和名：シロバナアキノハイルリソウ

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門田裕一：広島県産ルリソウ属（ムラサキ科）の１新種，アキノハイルリソウ

広島県からムラサキ科ルリソウ属の1新種，アキノハイルリソウ *Omphalodes akiensis* Kadotaを記載した．この植物は従来「広島県産ハイルリソウ」として知られてきた植物であり，花後，花序基部の苞葉の腋に幼苗をつけ，葉は両面共に一種類の長い伏毛で被われる点で，愛知県特産として知られるハイルリソウ *O. prolifera* Ohwiに似ている．しかし，アキノハイルリソウはハイルリソウと，次のような点で異なっている：①根生葉はやや質が厚く，しばしば鈍い光沢があり，葉身の基部がやや急に細くなり，明瞭な葉柄をもち，②花茎は春先の芽出しの頃から地面を這い，しばしば長さ50 cmにも達し，③花序は二叉分岐し，④萼筒がより短くかつ浅く分裂し，萼裂片は狭卵状楕円形，鈍頭である．アキノハイルリソウには稀に白花品が見られ，これを新品種シロバナアキノハイルリソウ *O. akiensis* Kadota f. *albiflora* Kadotaとして記載した．

アキノハイルリソウは広島県に分布し，隣接する鳥取県西南部でも得られている．本種は広い谷地形に見られ，低標高地の林縁に生育する．同属のヤマルリソウ *O. japonica* (Thunb.) Maxim.と同所的に生育することが多いが，アキノハイルリソウの花期は約一ヶ月ほど遅い．

ハイルリソウは長野県からも報告されてきたが，その報告の根拠になった標本を検討した結果，ヤマルリソウであることを確認した．したがって，ハイルリソウは愛知県の固有種となる．2009年5月に愛知県瀬戸市定光寺山周辺（ハイルリソウの基準産地）周辺で調査を行ったが，ハイルリソウを見出すことができなかった．ハイルリソウは絶滅した可能性が高い．

広島市の窪田正彦・美良子ご夫妻には広島県及び鳥取県，島根県，岡山県において精力的に調査を行ってきただき，数多くの生品と標本を国立科学博物館に寄贈していただきました．北海道教育大学旭川校の西川恒彦教授にはアキノハイルリソウとヤマルリソウの染色体数を算定していただきました．名古屋市の吉田國二氏，神奈川県立生命の星・地球博物館の勝山輝男氏にはハイルリソウに関して貴重な情報を賜りました．ここに記して感謝の意を表します．

（国立科学博物館植物研究部）